AQUATIC SYSTEMS IMPOUNDMENTS HABITATS NARRATIVE

Habitat description

Impoundments are artificially constructed or maintained standing or flowing water bodies.

Problems affecting species and habitats

Species threats

Respondents ranked threats to wildlife in aquatic systems impoundments habitats in Indiana:

Rank	Threats to wildlife in aquatic systems impoundments habitats
1	Species overpopulation
2	Invasive/non-native species
3	Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
4	Habitat loss (feeding/foraging areas)
5 (tie)	Habitat loss (breeding range)
5 (tie)	Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)
5 (tie)	High sensitivity to pollution
6	Predators (native and domesticated)
7 (tie)	Bioaccumulation of contaminants
7 (tie)	Regulated hunting and fishing (too much)

Respondents did not note additional threats to wildlife in aquatic systems impoundments habitat in Indiana.

Respondents listed top threats to wildlife in aquatic systems impoundments habitat in Indiana (not ranked):

- Overpopulation
- Habitat loss (feeding areas) -- many reservoirs are getting very old and the once-abundant standing timber is now diminishing which is reducing cover for white crappie
- Dependence on irregular sources -- in many reservoirs, shad is the dominant forage base for crappie. If shad are growing extremely fast, crappie can only utilize shad for a short period of time before the shad outgrow the size crappie can consume
- Competition with invasives, namely gizzard shad
- Water level control regimes at impoundments

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to wildlife in aquatic systems impoundments habitats. Their responses included:

- Yes

Habitat threats

Respondents ranked threats for aquatic systems impoundments habitat in Indiana:

Rank	Threats for impoundment habitats
1	Nonpoint source pollution (sedimentation and nutrients)
2	Habitat degradation
3	Point source pollution (continuing)
4	Impoundment of water/flow regulation
5 (tie)	Agricultural/forestry practices
5 (tie)	Drainage practices (stormwater runoff)
6	Stream channelization
7 (tie)	Invasive/non-native species
7 (tie)	Residual contamination (persistent toxins)
7 (tie)	Commercial or residential development (sprawl)
8	Mining/acidification

Respondents did not note additional threats to aquatic systems impoundments habitat in Indiana.

Respondents noted top threats to aquatic systems impoundments habitat in Indiana (not ranked):

- Regulation of impounded water: Extreme water fluctuations in mainly the Army Corps reservoirs can negatively effect crappie populations especially if the water fluctuations occur during spawning
- Habitat degradation: The natural decomposition of flooded timber and woody debris is lessening available cover for crappie. Also, siltation covers root wads left in the bottom of an impoundment which eliminates useable crappie cover
- Habitat loss/degradation due to a variety of circumstances

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to aquatic systems impoundments habitats. Their responses included:

- Yes

Additional research and survey efforts

Current body of research

Species research

All respondents indicated that research about wildlife in aquatic systems impoundments habitat in Indiana is adequate.

Respondents identified the following citations (title, author, date, publisher) that would give the best overview of wildlife in aquatic systems impoundments habitats in Indiana.

Title = Many in AFS journal of fish management and transactions of AFS

Title = Impoundments Strategic Plan;
Author = IDNR - Fish and Wildlife;
Date = 1997;
Publisher = IDNR - Fish and Wildlife

Habitat research

Two-thirds of respondents indicated that research on aquatic systems impoundments habitat in Indiana is Inadequate.

Respondents did not identify citations (title, author, date, publisher) that would give the best overview of aquatic systems impoundments habitats in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research for aquatic systems impoundments habitats. Their responses included:

- Yes

Research needs

Species research

Respondents ranked research needs for wildlife in aquatic systems impoundments habitat in Indiana:

Rank	Research needs for wildlife in impoundments habitat
1	Limiting factors (food, shelter, water, breeding sites)
2	Relationship/dependence on specific habitats
3 (tie)	Threats (predators/competition, contamination)
3 (tie)	Distribution and abundance
4	Population health (genetic and physical)
5	Life cycle

One respondent stated that research was needed for wildlife in aquatic systems impoundments habitat in Indiana regarding “how to produce more, larger crappie.”

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for wildlife in aquatic systems impoundments habitats. Their responses included:

- Yes

Habitat research

Respondents indicated the following research needs for aquatic systems impoundments habitat in Indiana:

Rank	Research needs for impoundments habitat
1	Threats (land use change/competition, contamination/global warming)
2	Distribution and abundance (fragmentation)
3 (tie)	Growth and development of individual components of the habitat
3 (tie)	Relationship/dependence on specific site conditions
3 (tie)	Successional changes

Respondents did not list other research needs for aquatic systems impoundments habitat in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for aquatic systems impoundments habitats. Their responses included:

- Yes

Conservation actions necessary

Species actions

Respondents ranked the following conservation efforts by how well they address threats to wildlife in aquatic systems impoundments habitat in Indiana:

Rank	Conservation efforts for wildlife in impoundments habitat
1 (tie)	Limiting contact with pollutants/contaminants
1 (tie)	Population management (hunting, trapping)

2	Reintroduction (restoration)
3 (tie)	Habitat protection (use below for details)
3 (tie)	Stocking
4	Culling/selective removal
5	Regulation of collecting
6	Translocation to new geographic range

Respondents listed no other current conservation practices for wildlife in aquatic systems impoundments habitat in Indiana.

Respondents recommended the following practices for more effective conservation of wildlife in aquatic systems impoundments habitat in Indiana:

- Habitat protection -- Actually, habitat enhancement by adding more woody cover to the old impoundments where the former woody cover has decomposed

One respondent stated that fish and wildlife in impoundment habitat "does not need [conservation practices]."

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation practices for wildlife in aquatic systems impoundments habitats. Their responses included:

- Yes

Habitat actions

Respondents ranked the following conservation efforts by how well they address threats to aquatic systems impoundments habitat in Indiana:

Rank	Conservation efforts for impoundments habitat
1	Managing water regimes
2	Pollution reduction
3	Protection of adjacent buffer zone
4	Land use planning
5	Habitat protection on public lands
6 (tie)	Cooperative land management agreements (conservation easements)
6 (tie)	Habitat restoration on public lands
7 (tie)	Habitat protection through regulation
7 (tie)	Artificial habitat creation (artificial reefs, nesting platforms)
7 (tie)	Corridor development/protection

7 (tie) Technical assistance

Respondents listed no other conservation practices for aquatic systems impoundments habitat in Indiana.

Respondents indicated that the following conservation actions are needed for aquatic systems impoundments habitat in Indiana (not ranked):

- Improve land use practices in watershed will reduce sedimentation in impoundments and reduce nutrient inputs. Reducing nutrient inputs will allow a deeper thermocline, which is important for crappie growth. Crappie growth suffers when water temperatures become too high
- Habitat restoration in the form of woody debris
- In Army Corps of Engineers impoundments alterations in water level control would likely benefit crappie

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation practices for aquatic systems impoundments habitats. Their responses included:

- Yes

Proposed plans for monitoring

Current monitoring

Species monitoring

Respondents indicated knowledge about the following monitoring efforts conducted by state agencies for wildlife in aquatic systems impoundments habitat in Indiana (not ranked):

- Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies
- Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies
- Regional or local once a year monitoring conducted by state agencies

Respondents indicated that they were not aware of any monitoring efforts conducted by other organizations for wildlife in aquatic systems impoundments habitat in Indiana.

Respondents ranked monitoring efforts by state agencies by their importance in conserving wildlife in aquatic systems impoundments habitat in Indiana:

Rank	Monitoring by state agencies for impoundments habitat
1	Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies

2 (tie) Regional or local once a year monitoring conducted by state agencies

2 (tie) Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies

3 Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies

Respondents did not consider monitoring efforts by other organizations crucial for conservation of wildlife in aquatic systems impoundments habitat in Indiana.

Respondents listed the following regional or local monitoring efforts by state agencies for wildlife in aquatic systems impoundments habitat in Indiana:

- IDNR - Division of Fish and Wildlife monitoring at
  - Patoka Lake
  - Hovey Lake
  - Dogwood Lake
  - Lake Sullivan
  - Many other lakes
- Many impoundments throughout the state have general fisheries survey conducted on them and crappie are caught during these

Respondents listed no regional or local species monitoring efforts by other organizations for wildlife in aquatic systems impoundments habitat in Indiana.

The following table reflects the opinions of multiple respondents, thus multiple check marks are possible. Additionally, some of these differences may reflect different taxonomic group bias.

Respondents ranked current monitoring techniques for wildlife in aquatic systems impoundments habitat in Indiana:

Current monitoring techniques for wildlife in aquatic systems impoundments	Used	Not used but possible with existing technology and data	Not economically feasible
Radio telemetry and tracking		X	
Modeling		X	
Coverboard routes			
Spot mapping		X	
Driving a survey route			X
Reporting from harvest, depredation, or unintentional take (road kill, by-catch)	X		

Mark and recapture	X	
Professional survey/census	X	
Volunteer survey/census	X	X
Trapping (by any technique)	X	
Representative sites	X	
Probabilistic sites		X

Respondents listed no other monitoring techniques for wildlife in aquatic systems impoundments habitat in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for wildlife in aquatic systems impoundments habitats. Their responses included:

- Yes

Habitat monitoring

Respondents indicated that neither state agencies nor other organizations currently conduct inventory and assessment of aquatic systems impoundments habitat in Indiana.

Respondents considered no inventory and assessment efforts by state agencies "very crucial" for aquatic systems impoundments habitat in Indiana. However, one-third felt the following efforts were somewhat crucial (not ranked):

- Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies
- Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies
- Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies

Respondents listed no inventory and assessment efforts by other organizations crucial for aquatic systems impoundments habitat in Indiana.

Respondents were not aware regional or local inventory and assessment by state agencies or other organizations for aquatic systems impoundments habitat in Indiana. Respondents listed no organizations involved in habitat inventory and assessment.

The following table reflects the opinions of multiple respondents, thus multiple check marks are possible. Additionally, some of these differences may reflect different taxonomic group bias.

Respondents considered current inventory and assessment techniques for aquatic systems impoundments habitat in Indiana as follows:

Current inventory and assessment techniques for	Frequently / Occasionally	Not used but	Not economically

aquatic systems impoundments habitat	used	possible with existing technology or data	feasible
GIS mapping		X	
Aerial photography and analysis		X	
Systematic sampling		X	
Property tax estimates			X
State revenue data			X
Regulatory information			X
Participation in landuse programs			X
Modeling			X
Voluntary landowner reporting			X

Respondents noted no other inventory and assessment techniques for aquatic systems impoundments habitat in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for aquatic systems impoundments habitats. Their responses included:

- Yes

Recommended monitoring

Species monitoring

Respondents recommended the following monitoring techniques for wildlife in aquatic systems impoundments habitat in Indiana (not ranked):

- Electrofishing surveys
- Trap netting surveys
- Gill netting surveys
- Angler creel surveys
- Population estimates
- Reporting from harvest (angler creel surveys) - This survey will show angler exploitation
- Professional survey (fish management surveys) - This survey will show size structure, relative abundance, and provide age and growth information

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for wildlife in aquatic systems impoundments habitats. Their responses included:

- Yes

Habitat inventory and assessment

Respondents recommended the following inventory and assessment techniques for aquatic systems impoundments habitat in Indiana:

- Systematic sampling would probably be best to determine the abundance of cover that is available, but could be very difficult as most of the habitat is hidden under the surface of the water

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for aquatic systems impoundments habitats. Their responses included:

- Yes